

The Four Season Observer



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Keep Those Spotter Reports Coming In!!!

The 1999 Severe Weather Season Recap ***Darin J. Figurskey, WCM***

Through the end of May, the severe weather season has not been tremendously active. Twenty-eight severe weather warnings have been issued for counties in southeast Lower Michigan since the beginning of the year, with 20 of those taking place on May 17th. Aside from May 17th, most of the severe weather has been of a variety that would be labelled "difficult and unusual", occurring basically in the absence of thunder and lightning. The following is a brief recap of the severe weather events that have taken place in 1999 through the end of May:

February 11th: A line of showers, with only isolated thunderstorms, moved across southwest Lower Michigan producing concentrated reports of wind damage. As the line approached the Saginaw Valley around 10 PM, it began to weaken very quickly. However, in Midland County, the wind with the showers was strong enough to blow a tree onto an automobile in Mills Township.

Also on this date, temperatures rose to all-time highs for February in southeast Lower Michigan, with readings of 70 degrees in Detroit and 68 degrees in Flint. The showers and isolated thunderstorms developed along a strong cold front, which resulted in a considerable drop in temperatures. By the 13th, highs only reached 32 degrees in Detroit and 31 degrees in Flint.

May 6th: Another line of showers, with only isolated thunderstorms, moved southwest-to-northeast across southeast Michigan late in the afternoon. Numerous reports of funnel clouds and tornadoes were received at the National Weather Service office in White Lake, prompting tornado warnings for Sanilac, Tuscola, and Huron Counties between 4:48 PM and 6 PM. A few reports of damage were received, and upon later inspection, it was determined that a weak tornado, rated F0 on the Fujita Scale, occurred near the Lapeer/Tuscola County border. The tornado moved from about 1 mile northwest of Clifford to 4 miles southwest of Kingston. Power lines and large trees were blown down in Ubyly in Huron County from straight-line wind.

May 17th: This was certainly the largest severe weather event of the season through the end of May, with 20 severe thunderstorm warnings issued between 3:36 PM and 9:18 PM. In addition, numerous special marine warnings resulted in parts of Lake Huron being under such a warning for seven consecutive hours. Many reports of hail and wind damage were received from across southeast Michigan. Early in the event, between 3 PM and 5 PM, hail was the primary threat, but the severe weather threat shifted more to the wind later on as storms developed into small lines and clusters. The largest hail reported was golfball size in Port Hope at 4:20 PM. Trees and power lines were blown down countywide across Shiawassee and Lapeer Counties, and a pole barn was destroyed in Saginaw County, 3 miles northwest of Oakley.

The most significant damage occurred in Sanilac County, where a line of thunderstorms resulted in windows being blown out of a home in Marlette around 7:10 PM, as well as considerable damage to a home and outbuildings just east of Deckerville at 7:40 PM. Farther south, near Dexter in Washtenaw County at 6:50 PM, trees and power lines blown down across I-94 resulted in a brief closure of the freeway. Spotters were a significant help during this event, with 32 individual reports from spotters logged at the White Lake office!

May 23rd: A band of showers, some with heavy rain, moved through southeast Lower Michigan during the late afternoon and early evening hours with a cold front. No thunder or lightning was indicated with the vast majority of the showers. However, around 4 PM, a weak tornado occurred just west of Rose Center in Lenawee County. Later, just before 8 PM, another weak tornado occurred just north of Imlay City in Lapeer County. Fortunately, there were no injuries from either tornado. Both tornadoes were categorized as F1 on the Fujita Scale. Footage captured by residents in the Imlay City area was delivered to the White Lake office and showed a very impressive display of the tornado as it did some property damage and moved across a field. Spotters can look forward to seeing this tornado in the next spotter and safety training season in 2000!

May 31st: Scattered showers and thunderstorms moved across the Saginaw Valley during the afternoon and evening hours. One thunderstorm resulted in a brief tornado, which moved across the north side of the city of Midland. Damage occurred to a hotel, a church, and some trees and homes. A picture of this tornado is on the cover of this newsletter. This tornado was categorized as F2 on the Fujita scale, making it one of the strongest tornadoes in Midland County since accurate records began to be kept in 1950. It is also only the 8th tornado confirmed in Midland County since 1950.

Thanks to the spotters who have provided the National Weather Service with valuable reports so far during the severe weather season. Thanks, too, to the individuals who have given the National Weather Service some great information when we have called them. The information received from spotters and call volunteers adds a lot of credibility to the warnings and statements that we issue, and helps forecasters understand the nature of the weather they are dealing with.

The storm surveys of the tornadoes mentioned in the above article can be found at:

<http://www.crh.noaa.gov/dtx/tor99sur.htm>

1999 Spotter and Safety Training ***Darin J. Figurskey, WCM***

The 1999 spotter and safety training season was another

successful one, with 46 presentations between February 2nd and April 30th resulting in the training of 1,921 individuals. Once again, every county in southeast Lower Michigan had a least one spotter and safety training presentation. A pair of late additions to the spotter training schedule for mid-June will increase slightly the total number of spotters trained. Information received from Marc Breckenridge, Emergency Manager for Washtenaw County, indicated that a record number (236) of spotters were trained in that county during 1999. In addition, a very successful spotter training effort was made in the Thumb with record attendance (174), and an advanced class was held in Cass City thanks to the combined work of the Emergency Managers from Tuscola (Pat Finn), Huron (Steve Leese), and Sanilac Counties (Linda Felker).

Through the dedication of the volunteer spotters, the National Weather Service, law enforcement, and county Emergency Services can help pass critical information along to the public and the media regarding the threat of severe weather in southeast Michigan. The efforts of the spotters are certainly appreciated! In addition, many thanks to Dr. Carl Ojala of Eastern Michigan University, Jim Wades of the Michigan Net, and Don Sefcik of Genesee County for conducting several basic and advanced spotter training presentations, helping the National Weather Service and Emergency Services reach as many people as possible.

For those interested in severe storm spotter training, begin to surf the National Weather Service's web site around the first of February for a preliminary list of spotter training sessions. The list is updated as soon as classes are scheduled through county or municipal Emergency Managers. If your county or city is not listed, or you want to register for a class, contact your Emergency Manager's office for more information.

Overpasses Prove Inadequate Storm Shelters ***By Rochelle Hines, AP Writer on 5/14/1999***

They became some of the familiar scenes after Oklahoma tornadoes on May 3, 1999—people bloodied and mud-splattered emerging from the crawl spaces under interstate overpasses near Oklahoma City.

But the “under the girder” shelter isn't the safe haven many might suspect. Scientists at the National Weather Service believe they are among the worst places people can go when a tornado is bearing down.

“One of the problems with ‘under the girder’ kind of shelter is that it can become a wind-tunnel effect,” Jim Purpura, warning coordination meteorologist at the National Weather Service in Norman, said on May 6th. “Winds are stronger and more focused underneath it. It's like the intersection between two buildings. That can be a catcher for debris such as automobiles.”

Terry Porter, her husband, Kevin, and their son, Benjamin, learned that the hard way when they fled their Oklahoma City home toward Interstate 35 on May 3rd. They made it to an overpass on the east side of the highway and ran up the incline to the ledge beneath the overpass.

The wind began sucking their son out, but her husband was able to shield him, Terry Porter, 47, said Thursday. “The next thing I remember is stuff hitting me in the back of the head. My husband said he thought we were caught up in the tornado, like we were whirling around in there.” Their 2-year-old son suffered cuts and bruises; Terry Porter suffered a concussion, and Kevin Porter, 43, suffered a broken foot, deep lacerations to his arms and other injuries requiring surgery, she said. Meanwhile, the house they fled was unscathed.

In the case of some of the storm victims, Purpura thinks those who were killed while on the highway didn't know about the danger until it was too late. “There were many services available that would have given those people enough information to make an informed decision,” he said. “Some people just drove right up into the storm.”

One of those victims was Tram Thu Bui, 26, who was identified Thursday as the 44th victim of the tornado. Her body was found May 5th a short distance from the overpass where she and her family had sought shelter May 3rd. Bui's husband, Thuanh, grabbed the couple's two children, and they all tried to huddle under the bridge. But by the time he turned around, Bui was gone, said her father-in-law, Bernie Beres.

Another highway victim was Anadarko resident Kathleen Walton, who sought refuge from the tornado under an overpass on I-35 with her son, Levi. Levi, 11, was injured. He said his mother told him she loved him and then let go of him as the violent winds passed. Yet another victim was killed when she was sucked from her sports car on Interstate 44 and thrown into a field near the highway.

Purpura said many people may perceive that getting under an overpass is safe. He said that may stem from 1991, when a television crew returning from the deadly storms in Andover, Kansas, sought shelter under an overpass and videotaped the twister as it passed. “It was a strong storm, but it did not have the violent storm winds that we saw on May 3,” Purpura said.

Purpura said the best way to be safe is to avoid the storm altogether. If that's not possible and the storm is some distance away, drivers should get off the road and into a building. “Once you get into an area where there is debris flying, there are only a few alternatives, and none of them are that good,” he said.

Bob Thies Retires

Birdie Nash, Hydrometeorological Technician (HMT)

On June 9, 1999, Robert E. Thies (the former NWS Detroit/ Pontiac Cooperative Program Manager or CPM) retired with more than 40 years of military and civilian government service. Bob had a long and distinguished career.

In 1957, Bob began his career by joining the Navy. He went to weather school and graduated in November 1957. After graduation, Bob served in the following locations: aboard the Navy sea plane tender the USS Pine Island; one year in Kodiak, Alaska; the San Diego

Fleet Weather Facility; Guam (where he also worked at the Typhoon Reconnaissance Squadron); one year on the USS Criskany aircraft carrier; and the Philippine Fleet Weather Facility at Sangley Point.

In early 1965, Bob took a brief break from his military travels by leaving the Navy to give civilian life a try. Later in 1965, he rejoined the military, but this time with the US Air Force.

After beginning his Air Force tour at Dobbin Air Force Base in Marietta, Georgia, he was transferred in 1966 to Iajes Field in the Azores. There he met and married Maria de-Silva.

Bob remained at Iajes Filed in the Azores until 1972, then he returned to the states. Bob next attended radiosonde school, followed by an assignment at Fort Hood, Texas. After Bob's Fort Hood tour, he returned to the Azores and remained until 1976.

After a shore tour at Chanute Air Force Base Illinois, he completed his last military assignment at Vance Air Force Base in Enid, Oklahoma. Bob then retired from the military in 1979.

In November 1979, Bob began his civilian government service with an assignment for the Department of Defense at Selfridge Air National Guard Base and he remained there until June 1986. He was then hired into the National Weather Service as a meteorological technician at the Weather Service office at Flint, Michigan. He transferred to the Detroit Metro Weather Service office in 1988 and then back to Flint in 1991. Bob remained at Flint until he was reassigned to the National Weather Service White Lake forecast office in June 1994.

In May 1995, Bob took over the CPM program and he ran the program from May 1995 until September 1998. Bob was very proud of his accomplishments in the CPM program. What Bob was most proud of during his Weather Service career was heading the state CPM program for the Lower Peninsula from May 1995 to May 1996.

Bob plans to remain the local area, enjoying and spending time with his wife, Maria, their children, Carla, Michelle, and Chris, and their two grandchildren, Samantha and Alex. Since Bob is already well-traveled, he plans to spend time enjoying and listening to his country music collection.

The NWS Hydrologic Program ***Danny Costello, Hydrologist***

The NWS White Lake issues several hydrologic products. The following are those products, their description, and criteria for issuance:

Flood or Flash Flood: The flooding of a general area such as normally dry low lying areas, urban areas, small rivers, streams, creeks, drainage ditches, underpasses, etc.

Flash Flood Warning (FFW): This product is issued when flooding occurs within six hours of the main rainfall, while **Flood Warnings (FFW)** are issued for flooding that takes longer to evolve, greater than six hours. Flash floods typically occur in the spring and summer and

are associated with intense rainfall from thunderstorms. Floods occur more in the fall and winter due to longer duration of light to moderate rainfall and/or snowmelt.

Flood/Flash Flood Watch (FFA): This product is issued when developing conditions indicate a threat for flooding or flash flooding. The watch is “normally” issued up to 24 hours in advance.

Flood/Flash Flood Statement (FFS): This product is issued to update the status of an ongoing watch or warning, or to remove part of or cancel the watch/warning.

River Flooding: The rise of a river to an elevation such that the river overflows its natural banks causing damage.

River Flood Warning (FLW): This product is issued for rivers that have an established flood stage at certain locations and are modeled by the River Forecast Center in Minneapolis, MN. The warnings are issued when previous rainfall or forecast rainfall indicates a river will equal or exceed the established flood stage for that reach of the river within 48 hours. The warnings will include the most recent observed reading, approximate time when flood stage will be reached, crest stage and time, and when it will fall back below flood stage. The date and stage of the most recent comparable flood crest will also be included. Other information such as known or anticipated damage effects will be included if possible.

River Flood Statement (FLS): This product is issued about every six hours to update or cancel part of or all of a current river flood warning. They will generally be issued between 3 and 5 PM, 9 and 11 PM, 4 and 6 AM, and 9 and 11 AM.

Flood Potential Outlook (ESF): This product is issued for the following:

- 1) As a River Flood Watch when forecasted rainfall amounts would likely cause the river to exceed flood stage in more than 48 hours, or the river would likely exceed flood stage in less than 48 hours but the probability of that much rainfall occurring is low or uncertain. This would be issued up to 48 hours in advance.
- 2) As an overall flood potential for Flooding/Flash Flooding and/or River flooding when future conditions indicate that a significant heavy rainfall event may occur. This is a long range outlook issued for time frames generally 24-72 hours.
- 3) Spring Snowmelt Flood Potential Outlook which is routinely issued four times a year from late February through early April. This outlook takes into account current snow depth and water equivalence of the snow pack, river levels, frost depth and soil moisture conditions, and uses future **normal** temperature and precipitation to calculate the potential crest of rivers with established flood stages.

River Statement (RVS): This product is issued when previous rainfall has caused rivers to rise rapidly, but the rivers are not expected to reach flood stage. This statement is issued to let people know that the river will have a moderate rise but should stay within flood stage.

The NWS White Lake office is responsible for the following list of river forecast points in southeast lower Michigan. A definition of stage proceeds the list.

Southeast Lower Michigan River Flood Stages		
Station	River	Flood Stage
Tecumseh	Raisin River	11 Ft
Adrian	Raisin River	13 FT
Blissfield	Raisin River	683 FT MSL*
Dundee	Raisin River	650 FT MSL*
Monroe	Raisin River	9 FT
Saline	Saline River	10 FT
Hamburg	Huron River	6 FT
Ann Arbor	Huron River	15 FT
Detroit	Rouge River	15 FT
Garden City 2NE	Middle Rouge	10 FT
Inkster	Lower Rouge	10 FT
Fraser 3N	Clinton River	16 FT
Mt Clemens	Clinton River	16 FT
Mt Clemens 2N	North Branch of Clinton River	15 FT
Davison 3W	Kearsley Creek	10 FT
Flint 4SE	Thread Creek	7 FT
Flint 1S	Swartz Creek	10 FT
Flint	Flint River	13 FT
Owosso	Shiawassee River	8 FT
Chesaning	Shiawassee River	15 FT
Fergus 1E	Shiawassee River	10 FT
Cass City 1SSW	Cass River	14 FT
Wahjamega	Cass River	18 FT
Vassar	Cass River	14 FT
Frankenmuth	Cass River	17 FT
Midland 7SW	Pine River	12 FT
Midland	Tittabawassee	24 FT
Saginaw	Saginaw River	19 FT

***MSL indicates above mean sea level. The NWS uses gaging stations and streamflow records provided from the U.S. Geological Survey (U.S.G.S.) They also determine the zero datum. In the case of Blissfield and Dundee, the U.S.G.S. never established records there. The NWS developed these sites using reference to MSL.**

Stage: This is the height or level of the river above an establish datum called **zero datum**, which is a point in reference to elevation above sea level where the gage is located. The river stage is the difference in feet between the river level elevation in sea level and the zero datum. Ex: zero datum is 560 feet msl and the river level was at 572 feet msl. The stage is 572-560 which would be 12 feet. If the river rose 2 more feet it would be at 574 feet msl or a stage of 14 feet. **This does not mean that the river is 14 feet deep.** The datum zero is usually defined several feet below the bottom of the river. This is in case the bottom gets dredged out from a flood, the river level wouldn't be below the zero datum which would lead to a negative stage.

The purpose of datum zero is to serve as a new mean sea level in order to avoid using large numbers to report the river stage. For example, in some parts of the country the river level may be 11,325 feet msl. It would be easier instead to say a stage of 20 feet having set the datum zero to 11,305 feet msl.

Flood Stage: This is the level of the river that the community wants the NWS to start providing warnings. It is usually the stage where some impact to life or structures begin somewhere in the reach of the river for which the forecast applies. The **Reach** can range from several feet to several miles upstream and downstream of the river gage.

Flash Flood Trivia

Six inches of fast-moving flood water can knock you off your feet, and a depth of two feet will float your car! Never try to walk, swim, or drive through such swift water, doing so may cost you your life.

Heat Awareness Day ***Darin J. Figurskey, WCM***

The National Weather Service offices serving Michigan, in cooperation with the Michigan Committee for Severe Weather Awareness, held its first annual Heat Awareness Day on Wednesday, June 9th. The emphasis of this outreach activity was to educate individuals about the dangers of excessive heat, and how to take actions to prevent heat disorders. In addition, National Weather Service products emphasizing the threat of excessive heat was promoted.

Heat kills by taxing the human body beyond its abilities, and approximately 175 individuals succumb to the demands of heat

annually. In the disastrous heat wave of 1980, more than 1,250 people died as a result of excessive heat. Hot temperatures, combined with high humidity, increase one's chances for developing heat disorders. It is important to consider the effects of the weather, including heat, when planning for or conducting any outdoor activities.

The National Weather Service issues heat advisories when the heat index is expected to be at least 105° F for 3 hours or more. Excessive heat warnings are issued when the heat index is expected to be 115° F for 3 hours or more. The heat index combines the effects of high temperatures and relative humidity, similar to how the wind chill combines the effects of cold temperatures and wind. Individuals can keep abreast of the latest forecasts of the heat index on very hot days by listening to National Weather Service forecasts and observational data over NOAA Weather Radio. Your local radio, television, or cable television stations also may provide this information.

Additional heat wave information, and safety publications on other weather topics, can be found by visiting the following National Weather Service website:

<http://www.nws.noaa.gov/om/nwspub.html>

La Nina: Did History Repeat Itself?

William R. Deedler, NWS Detroit/Pontiac Weather Historian

Now that the winter of 1998-99 is over, we can see whether this past winter was similar to other La Nina winters in southeast Lower Michigan.

At winter's start, most of December's weather was unseasonably sunny and warm with precipitation less than half the normal and snowfall almost nonexistent. A strong ridge of high pressure in the upper levels of the atmosphere that dominated the eastern half of the country through much of the month was mainly responsible for the mild weather. The upper ridge kept polar intrusions at bay until Christmas week, when a notable change took place. Ironically, this abrupt change in the jet stream and its resulting weather coincided very well with the findings of the other La Nina winters around the holidays.

This past winter's change to cold and snowy was quite dramatic in early January and was heralded into the area by a classic blizzard New Years weekend. By mid month, at least a couple of feet of snow had been dumped on the region and temperatures averaged nearly twelve degrees below normal! A strong, intense upper low pressure trough plunged south out of the Arctic into the eastern half of the country replacing the high pressure ridge that had dominated much of the fall and early winter. Then, just as abruptly as the Arctic upper low pressure plunged into the area in early January, it was booted northeast out of the area by late January by the persistent, strong Pacific jet stream. This returned much milder conditions to Southeast Lower Michigan with temperatures averaging above freezing (34F)! Normally, during late January, the temperature averages in the mid 20s.

The pattern of above normal to below normal temperatures

continued through the remainder of the winter with February being well above normal and March well below normal. In addition, the majority of the snowfall this season occurred during the months of January and March and nearly all of it during the first two weeks of each month. It is also interesting to note that the overall temperature/snowfall patterns of both months were ironically quite similar. The coldest of weather, along with nearly all the snowfall, occurred during the first half of January and March. On the flip side, in keeping with our “sine wave” or oscillation pattern, February held a fairly strong resemblance to December. In both months, temperatures averaged well above normal (7.0 degrees) with, not surprisingly, below normal snowfalls. Even in the month of April, this trend continued with above normal temperatures returning. While the majority of months do generally display a pattern of above normal and below normal temperatures, it is the exaggerated amplitude here that is most noteworthy.

When examining this past winter’s climate, one of the most striking statistics is the overall warmth of the winter. None of the other La Nina winters average temperatures was even above normal, let alone nearly four degrees. To get a better idea of this past winter’s temperature cycle, one must look at the actual upper wind flow that prevailed this past winter and compare it to the normal (or average) La Nina winter upper air pattern. One of the most common characteristics of the La Nina winter patterns, though not exclusive to La Nina, is a rather transient amplified upper air (jet stream) pattern, rather than a zonal flow, which is more typical of an El Nino phenomenon. This amplified pattern is commonly referred to as a “progressive” pattern, meaning the position of the overall wind flow pattern generally moves along from west to east and varies considerably. Therefore, upper troughs and ridges generally do not lock into place for any extensive period of time. This classic, progressive and amplified La Nina pattern did, in fact, dominate the U.S. throughout much of the 1998-99 winter season. The progressive trough-ridge-trough pattern brought considerable variability in the winter weather to the Great Lakes region, including some extremes. When reviewing this past winter climate statistics, one can actually visualize the transient “sine wave” upper air pattern cycle and its resultant weather.

As far as snowfall went this past winter, the snowfall total of the 1973-74 season was nearly duplicated this past winter (49.2 vs 49.5). The snowfall pattern was quite similar to that of 1928-29 and the severe winter of 1903-04. There was also the familiar “sine wave” pattern in last winter’s snowfall where snowfall peaked in January and this, too, was present in the winters of 1928-29 and 1903-04 (the winter of 1886-87 also reflects the same familiar pattern, but the snowfall maxed-out earlier in December).

Michigan Slides & Videos Still Wanted ***Jeff Boyne, Forecaster***

We have already received some video and pictures of some of the severe weather events this year, but unfortunately there will be more severe weather to come. We would like to include pictures and video of these events, too.

If you would like to contribute and have video or pictures of a

significant weather event, please send it to the NWS Detroit/Pontiac at:

National Weather Service
Attention: The Four Season Observer
9200 White Lake Road
White Lake, MI 48386

We will copy the video or make the picture into a slide and then send it back to you. Thank you!

***Keep All those Valuable
Spotter and Precipitation
Reports Coming in!!!!***

